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IMPLEMENTATION PLAN REVIEW FOR MARYLAND AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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February 1975

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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IMPLEMENTATION PLAN REVIEW

FOR

MARYLAND

AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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February 1975

MARYLAND

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV required EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, four predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are (1) the state's prerogative to surpass NAAQS; (2) the use of the example region approach in developing State-wide air quality control strategies; (3) the existence of state air quality standards which are more stringent than NAAQS; and (4) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations effect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted Air Quality Control Region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in controls which are more stringent than needed to attain NAAQS, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned state-wide where the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based are the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution situations such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO_2 and TSP emission tolerances within each of the various AQCRs. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendices C, D, and E.

The State Implementation Plan for Maryland has been reviewed for the most prevalent causes of over-restrictive fuel combustion emission limiting regulations. The major findings of the review are:

FOR TOTAL SUSPENDED PARTICULATES, THERE IS LITTLE INDICATION THAT CURRENT EMISSION REGULATIONS ARE OVER-RESTRICTIVE.

FOR SULFUR DIOXIDE, THERE ARE INDICATIONS THAT CURRENT EMISSION LIMITS MAY BE REVISED IN SOME OF THE AIR QUALITY CONTROL REGIONS.

The supportive findings of the SIP review are as follows:

Like many areas of the nation, high levels of total suspended particulates were found in Maryland during 1973. Federal air quality standards were exceeded in all but the Southern Maryland Air Quality Control Region which has been rated as a good candidate for revision of particulate emission regulations.

Ambient levels of sulfur dioxide during 1973 did not violate either the annual or 24-hour Federal standard in any AQCR. The State standards which are more stringent were violated in some of the AQCRs.

The Eastern Shore AQCR and the Southern Maryland AQCR are rated as good candidates for revision of current SO_2 emission limits. Marginal candidates for revision are the National Capital, Central Maryland and Cumberland-Keyser regions.

Recent action by the State of Maryland parallels the intention of Section IV of ESECA. In an attempt to reduce the impact of fuel shortages, the State has proposed a plan revision which would postpone the date of fuel oil sulfur content limits until 1980. The regulation requiring 0.5% sulfur content is scheduled to go into effect July 1, 1975.

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors.

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS in the State Implementation Plan?
- Based on (1973) air quality data, are there no reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices

provide an AQCR analysis which helps establish the overall potential for revising regulations.

Based on an overall evaluation of EPA's current information, AQCRs have been rated as either a good, poor or marginal candidate for revising emission limiting regulations. These ratings which are shown in Table 2-1 were determined by assessing the following criteria:

Good	Poor	Marginal
1) Adequate number of air monitoring sites	1) Violation of NAAQS	1) No air quality data or insufficient number of monitoring sites
2) No NAAQS violations	2) Attainment date for NAAQS later than 1975	2) Inconsistent "indicators"
3) Attainment date of 1975 for NAAQS in the SIP	3) Proposed AQMA	
4) No proposed AQMAs	4) Modeling results show no potential for regulation revision	
5) Modeling results show a potential for regulation revision		

For an AQCR to be rated as a good candidate, all of the criteria listed under "Good" would have to be satisfied. The overriding factor in rating an AQCR as a poor candidate is a violation of either the primary or secondary National Ambient Air Quality Standards during 1973. However, if any of the other conditions listed under "Poor" exists, the AQCR would still receive that rating. The predominant reason for a marginal rating is a lack of sufficient air quality data. In Priority III regions, air monitoring was not required during 1973, therefore, there may be no data with which to determine the current air quality status. However, in Maryland there are sufficient data for all of the regions. Marginal ratings are also given when there are varying or inconsistent "indicators".

After a candidacy has been given to a region, a follow-up analysis should be conducted depending on the rating. A region that has been indicated to be a good candidate for regulation revision should be examined in more detail by the State and the Regional office of the EPA, including an examination of current air quality, emissions, and fuel use data, with which the state has

more familiarity. If the state feels that clean fuels could be saved in a region rated marginal then an analysis of air quality data that may have become available since this report should be examined. If current data do not indicate a potential for regulation revision then further study would not be warranted. An AQCR that has been indicated to be a poor candidate would not warrant further study unless the state feels that new information has become available indicating that the poor rating is no longer valid.

TABLE 2-1

STATE IMPLEMENTATION PLAN REVIEW
(SUMMARY)

"Indicators"	State		National Capital AQCR 47		Central Maryland AQCR 112		Cumberland Keyser AQCR 113		Eastern Shore AQCR 114		Metropolitan Baltimore AQCR 115		Southern Maryland AQCR 116	
	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	Yes	Yes												
• Does the State have emission limiting regulations for control of:														
1. Power plants	Yes	Yes												
2. Industrial sources	Yes	Yes												
3. Area sources	Yes	Yes												
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	No	No												
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	Yes	No												
• Are there no proposed Air Quality Maintenance Areas?			No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Is there an expected 1975 attainment date for NAAQS in the State Implementation Plan?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there no reported violations of NAAQS?			No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes
• Based on (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes
• Are the total emissions from stationary fuel combustion sources proportionally lower than those of other sources?			No	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?[a]			No	Yes	N.A.	N.A.	N.A.	N.A.	No	Yes	N.A.	N.A.	Yes	Yes
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			Poor	Marg.	Poor	Marg.	Poor	Marg.	Poor	Good	Poor	Poor	Good	Good

[a] Modeling data available for power plants only.

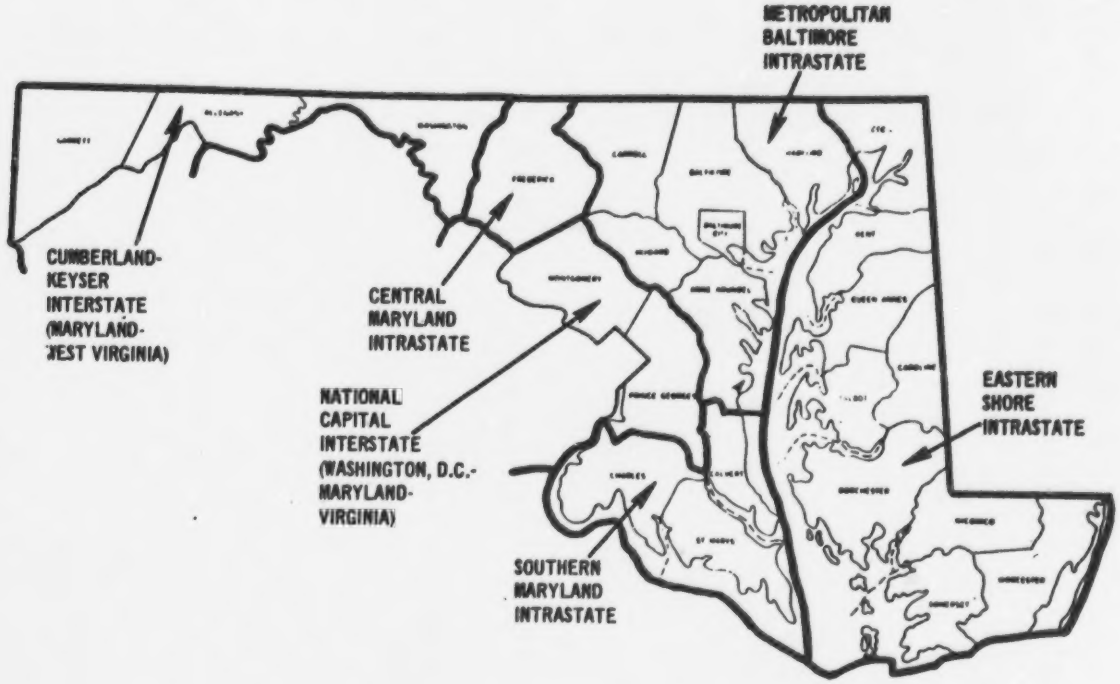

Figure 2-1 MARYLAND AIR QUALITY CONTROL REGIONS

2.2 AIR QUALITY SETTING FOR THE STATE OF MARYLAND

2.2.1 Maryland Air Quality Control Regions

The State of Maryland has been divided into six Air Quality Control Regions. The Federal designations of these regions and the other states that comprise the interstate regions are as follows:

National Capital Interstate (Virginia, District of Columbia)
Central Maryland Intrastate
Cumberland-Keyser Interstate (West Virginia)
Eastern Shore Intrastate
Metropolitan Baltimore Intrastate
Southern Maryland Intrastate

These regions are also listed in Table A-1 as well as the priority classifications for total suspended particulates and sulfur dioxide, an estimate of the 1975 population in each region, and proposed Air Quality Maintenance Areas.

2.2.2 Ambient Air Quality Standards

Maryland has adopted ambient air quality standards for both total suspended particulates and sulfur dioxide. As shown on Table A-2, the State standards are more stringent than the Federal standards for both of these pollutants. A one-hour standard for sulfur dioxide has also been adopted by the State although there is not a Federal standard for this time interval.

2.2.3 Air Quality Status

Air monitoring data for total suspended particulates and sulfur dioxide are summarized in Tables A-4 and A-5 respectively. These data are from the "Maryland State Yearly Air Quality Data Report, 1973" and the SAROAD data bank as of July, 1974.

During 1973, ambient levels of total suspended particulates exceeded Federal standards in all but the Southern Maryland AQCR. Significant reductions in the 1973 levels are needed for these regions to meet standards, with the greatest reduction required in the Metropolitan Baltimore region. This region recorded the highest annual and second highest 24-hour average in the State. The annual primary standard was also exceeded in the Central Maryland and Cumberland-Keyser regions, indicating that these regions have experienced

sustained periods of high suspended particulate levels.

Sulfur dioxide levels during 1973 did not exceed either the annual or 24-hour Federal standard in any of the Air Quality Control Regions. The highest annual average, and the second highest 24-hour average were recorded in the Metropolitan Baltimore AQCR.

The Eastern Shore and Southern Maryland regions are classified Priority III for sulfur dioxide, and although air monitors were not required during 1973, there are adequate air quality data for both of these regions.

2.2.4 Emissions Summary

A summary of particulate and sulfur dioxide emissions for each region is presented in Tables A-6 and A-7 respectively. These data are from the Maryland Bureau of Air Quality Control emission inventory.

Fuel combustion sources, as shown in Table A-8, account for the majority of particulate emissions in all but the Central Maryland and Metropolitan Baltimore Air Quality Control Regions. These sources do however, contribute the majority of sulfur dioxide emissions in all of the regions.

Particulate and sulfur dioxide emissions from power plants and other point sources are shown in Appendices C and D respectively.

2.3 BACKGROUND ON THE DEVELOPMENT OF MARYLAND'S CURRENT STATE IMPLEMENTATION PLAN

2.3.1 Control Strategy For Particulate Matter And Sulfur Oxides

A. Maryland portion of the National Capital Interstate Region The January 28, 1972, Implementation Plan indicated that Maryland's control strategy when combined with Virginia's and the District of Columbia's was adequate for attainment of the primary standards by 1975 but was not adequate for attainment of the secondary standards. However, the EPA evaluation of Maryland's existing plan (May 28, 1970, and addendums) entitled "Evaluation of Maryland's 'Existing' Sulfur and Particulate Matter Implementation Plan for the National Capital Interstate Air Quality Control Region (NCIAQCR)," July 29, 1971, indicated that the combined control strategies of Virginia, the District of

Columbia and Maryland were capable of reducing emissions sufficiently to allow attainment of the secondary standards for particulate matter and sulfur oxides throughout the National Capital Interstate Region by 1975. The Administrator approved Maryland's control strategy in his August 4, 1971, letter to the Governor of Maryland, and this approval was finalized in the Federal Register of February 3, 1972, Vol. 37, No. 23.

EPA and the State will continue to monitor the air quality readings in the National Capital Region to determine the accuracy of the diffusion model predictions.

B. Central Maryland Intrastate Region Maryland demonstrated the attainment of national standards by creating a sub-region around the only large town in the Region, Frederick City. This urban area represents the largest center for industry and population in the Region, and is the area expected to have the greatest increase in pollutant concentrations. Maryland used growth factors and proportional modeling to show that concentrations of sulfur oxides and particulate matter will be reduced below the national standards by 1975.

C. Cumberland-Keyser Interstate Region Because of the mountainous terrain and complex meteorology, Maryland divided the region into three sub-regions: the Hagerstown area, the Cumberland area, and the Luke area. A proportional rollback was used to project future (1975) air quality levels, after application of the State's adopted emission limitations, for sulfur oxides and particulate matter in each sub-region. Growth factors were included in these calculations. This proportional rollback predicted air quality levels for 1975 which are well below secondary standards for both pollutants.

D. Eastern Shore Intrastate Region (Particulate matter) After considering the rural character of this Region, Maryland divided it into three sub-regions which are located around the three large towns of Elkton, Cambridge, and Salisbury. These three towns represent the largest concentrations of industry and population in the Region and are the areas where the greatest concentration of particualte matter accumulates. Proportional modeling techniques were employed to predict the degree of emission reduc-

tions needed in each sub-region to meet the national standards. The proportional rollback for the Elkton sub-region and the Cambridge sub-region predicted that air quality levels would be well below the secondary standards by 1975. The proportional rollback for the Salisbury sub-region predicted that air quality levels would attain the secondary standards for particulate matter by 1975. Thus, with growth factors applied, the proportional model indicated that the secondary standards for particulate matter would be attained.

(Sulfur oxides) The Eastern Shore Intrastate Region is classified Priority III for sulfur oxides. Current emissions of sulfur oxides will be significantly reduced by Maryland's sulfur-restrictions-in-fuels regulation.

E. Metropolitan Baltimore Intrastate Region EPA approved the control strategy in Maryland's "existing" plan (December 23, 1970, and addendums). This plan included a control strategy that was judged adequate for attainment of the secondary standards for particulate matter and the primary standards for sulfur oxides. This approval was documented in EPA's July 29, 1971, "Evaluation of Maryland's 'Existing' Sulfur oxides and Particulate Matter Implementation Plan for the Metropolitan Baltimore Intrastate Air Quality Control Region (MBIAQCR)." The Administrator's approval was finalized in the Federal Register of February 3, 1972, Vol. 37, No. 23. The January 28, 1972 Implementation Plans (and addendums) referenced EPA approval of the December 23, 1970 "Existing" Plan. The emission limitations which were part of the "existing" plan remain in effect, and in some cases are more stringent. Thus, the control strategy is capable of reducing emissions sufficiently to allow attainment of the secondary standards for particulate matter and of the primary standards for sulfur oxides.

F. Southern Maryland Intrastate Region This Region is classified Priority III for both sulfur oxides and particulate matter. Maryland applied its control strategy to the sources emitting pollutants in the Region, and projected substantial reductions in emissions of both pollutants.

2.4 PROPOSED STATE IMPLEMENTATION PLAN REVISION

The State has proposed a plan revision which would postpone the sulfur-in-fuel limits for fuel oil until 1980. The current regulations require 1% or less sulfur for residual oil which is to decrease to 0.5% on and after July 1, 1975.

3.0 CURRENT ASSESSMENTS BASED ON STATE IMPLEMENTATION PLAN REVIEW

The purpose of this section is to evaluate the available information for the State of Maryland and determine the feasibility of revisions to the SIP which would result in clean fuel conservation. The assessments will be made by AQCR addressing each type of fuel combustion source: power plants, large industrial and commercial/institutional sources, and area sources. The assessments must be made for each pollutant separately and are made on the basis of seven criteria: (1) 1973 air quality violations; (2) expected NAAQS attainment dates; (3) proposed Air Quality Maintenance Area (AQMA) designations; (4) total emissions; (5) portion of emissions from Maryland fuel combustion sources; (6) regional tolerance for emissions increase; and (7) pollutant priority classifications. Tables B-1 and B-2 tabulate these criteria for each AQCR for TSP and SO_2, respectively.

As mentioned previously, regional air quality data for 1973 are presented in Tables A-4 and A-5 for total suspended particulates and sulfur dioxide respectively. Table C-1 shows the 1973 fuel use and sulfur content of the fuel for each of the Maryland power plants. The sulfur content is an average content for the year, as variations of up to 20% are common. Table C-2 is a summary of modeling results for power plants in three AQCRs.[1] Although it is realized that there are some limitations to results obtained by modeling, it is presented in this report as another indicator in assessing the candidacy of a region to revise emission regulations.

Appendix D shows the fuel use and emissions data for the major fuel combustion sources in each of the Air Quality Control Regions. Only those sources emitting 100 tons per year or more of particulates or sulfur dioxide are listed. Appendix E shows the total fuel use for each AQCR.

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[1] The modeling analysis of the power plants was performed by the Walden Research Division of Abcor Inc. The model used was a Gaussian plume model developed by the Meterology Laboratory, EPA, and was based on 1972 plant operations. Detailed information can be found in; Modeling Analysis of Power Plants for Fuel Conversion, (Group III) September 9, 1974.

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3.1 NATIONAL CAPITAL INTERSTATE AIR QUALITY CONTROL REGION

3.1.1 Regional Assessment

During 1973, suspended particulate levels in the Maryland portion of this AQCR equalled the Federal annual secondary standard and exceeded the 24-hour secondary standard (Table A-4). The annual and 24-hour primary standards were exceeded in the other jurisdictions within this AQCR. The Maryland portion has been proposed as an Air Quality Maintenance Area for particulate matter. This region has been rated as a poor candidate for relaxing particulate emission regulations.

Sulfur dioxide levels in this region did not exceed the Federal annual or 24-hour standards during 1973, although readings recorded in the District of Columbia were close to the 24-hour standard (Table A-5). Air monitoring data for Maryland indicate that SO_2 levels were well below the Federal standards and exceeded only the lower limit of the more adverse range of the State standard for a 24-hour period. There is no proposed AQMA for sulfur dioxide in the Maryland portion of this region, however the District of Columbia has been proposed as an AQMA. This region has been rated as marginal for regulation revision.

3.1.2 Power Plant Assessment

There are two Maryland power plants in this region, the Dickerson plant in Montgomery County, and the Chalk Point plant in Prince Georges County (Table C-1).

The Dickerson plant has been burning coal with an average sulfur content of 1.64% during 1973 and is operating under a variance pending completion and successful operation of a flue gas desulfurization system.

The Chalk Point plant is also operating under a variance which includes a schedule for installation of a flue gas desulfurization system contingent upon the success of the system at Dickerson. There are some modeling data presented in Table C-2 which show the maximum contribution to the ambient suspended particulate and sulfur dioxide levels that are attributed to the plant. The data indicate that at maximum load, the plant will contribute approximately 155 $\mu g/m^3$ to the ambient levels of sulfur dioxide

under certain conditions which may occur 5% of the time. These concentrations would not cause violations of the Federal SO_2 standards in the Maryland portion of the region based on 1973 air quality data, although they may cause violations of the State standards. It should be noted that these modeling results do not consider the operation of the additional 660 MW unit at this plant.

3.1.3 Industrial, Commercial, Institutional Source Assessment

The Maryland fuel combustion sources in this region which emit 100 tons or more per year of either particulate matter or sulfur dioxide are listed in Table D-1. All of these sources are firing oil with a sulfur content of 1% or less. A switch to coal by these sources is not feasible since particulate standards were exceeded in this region during 1973. The use of higher sulfur oil may be possible depending on current air quality analysis. Point source fuel combustion excluding power plants accounts for approximately one-percent of the particulate and sulfur dioxide emissions in the Maryland portion of the region.

3.1.4 Area Source Assessment

Fuel use by area sources in this region is shown in Table E-1, and consists of primarily oil and natural gas as would be expected. Area sources afford little potential for clean fuel savings because of the economic considerations in changing fuel burning equipment. The primary means of achieving clean fuel savings by the sources that are firing coal or oil is a switch to a higher sulfur content fuel. Since this region is a marginal candidate for SO_2 emission relaxation, further study would be needed before any revisions are considered. Area source fuel combustion in the Maryland portion of this AQCR accounts for an estimated seventeen percent of the particulate emissions and four percent of the sulfur dioxide emissions.

3.1.5 Fuel Use Assessment

Fuel use by the region is shown in Appendix E.

3.2 CENTRAL MARYLAND INTRASTATE AIR QUALITY CONTROL REGION

3.2.1 Regional Assessment

This region consists only of Frederick County and has no proposed AQMA for either particulate matter or sulfur dioxide.

Suspended particulate levels during 1973 in this region exceeded both the Federal annual and 24-hour standards (Table A-4). There is virtually no potential of relaxing particulate emission regulations and this region has been given a poor rating.

Sulfur dioxide levels during 1973 were well below both the Federal and State standards, and there is a tolerance for an increase in SO_2 emissions without violating standards (Table A-5). This region has been rated as marginal for relaxation of SO_2 emission limits although few sources would derive any benefit from a revision.

3.2.2 Power Plant Assessment

There are no power plants in this Air Quality Control Region.

3.2.3 Industrial, Commercial, Institutional Source Assessment

The sources emitting 100 tons or more per year of either particulates or sulfur dioxide are listed in Table D-1. There is little potential for a clean fuel savings afforded by these sources although a switch to higher sulfur content oil may be possible. Point source fuel combustion accounts for an estimated four-percent of the particulate and twenty-six percent of the sulfur dioxide emissions in the region.

3.2.4 Area Source Assessment

As shown in Table E-1, area sources account for a majority of the distillate oil use and all of the natural gas use in this region. As with point sources, there is little clean fuel savings potential. Area sources contribute an estimated nineteen-percent of the particulate emissions and thirty-seven percent of the sulfur dioxide emissions.

3.2.5 Fuel Use Assessment

Fuel use data for the region are presented in Appendix E.

3.3 CUMBERLAND-KEYSER INTERSTATE AIR QUALITY CONTROL REGION

3.3.1 Regional Assessment

Suspended particulate levels during 1973 exceeded the Federal annual

and 24-hour standards (Table A-4). There are two counties that comprise a proposed Air Quality Maintenance Area for particulate matter in the Maryland portion of this region. There is little potential for revising particulate emission regulations in this region and has been rated as a poor candidate.

Sulfur dioxide concentrations were not in violation of either the Federal or State annual and 24-hour standards during 1973. There is no proposed Air Quality Maintenance Area in this region for sulfur dioxide and is rated as a marginal candidate for relaxation of SO_2 emission regulations.

3.3.2 Power Plant Assessment

There is one Maryland power plant in this region, the R.P. Smith plant in Washington County. This is a coal fired plant, therefore, it does not have a fuel switch case. The average fuel sulfur content at this plant was less than 1% during 1973, and a possibility exists of allowing a higher sulfur content fuel to be used. There are no modeling data however, to determine the maximum allowable fuel sulfur content that could be used without violating air quality standards. This plant accounts for approximately nine percent of the particulate emissions and sixteen percent of the sulfur dioxide emissions in the Maryland portion of the region.

3.3.3 Industrial, Commercial, Institutional Source Assessment

There are several major fuel combustion sources in this region which are listed in Table D-1. Many of these sources are using high sulfur coal, affording little potential for clean fuel savings. Point source fuel combustion contributes approximately thirty percent of the particulate emissions and over seventy percent of the sulfur dioxide emissions in the region.

3.3.4 Area Source Assessment

Area sources account for a small percentage of the fuel use in this region (Table E-1), but a significant amount of the particulate and SO_2 emissions. Again, there is little potential for clean fuel savings afforded by these sources.

3.3.5 Fuel Use Assessment

Fuel use data by the region are presented in Appendix E.

3.4 EASTERN SHORE INTRASTATE AIR QUALITY CONTROL REGION

3.4.1 Regional Assessment

Suspended particulate levels during 1973 exceeded only the secondary 24-hour standard at one monitoring site (Table A-4). However, this site is located near the northeast corner of the State and may not be representative of the AQCR.

Ambient levels of sulfur dioxide did not exceed either the annual or 24-hour Federal and State standards, and based on the air quality data, there is a tolerance for an increase in SO_2 levels without violating standards. There are no proposed Air Quality Maintenance Areas in this region for either particulate matter or sulfur dioxide and is rated as a good candidate for revision of SO_2 emission limits.

3.4.2 Power Plant Assessment

There are two power plants in this region, Vienna in Dorchester County, and Easton Utilities in Talbot County. These are both oil fired facilities, however the latter plant has very low fuel use.

The Vienna plant has four boilers, three of which are convertible to coal. During 1973, the fuel oil sulfur content averaged 0.9%, increasing to 1.44% during the first part of 1974, during which time the plant operated under a variance. Since particulate levels in this region did exceed standards during 1973, a switch to coal is impractical as particulate control at this plant is limited. Modeling results as shown in Table C-2 indicate that with a switch to coal, particulate emissions from this plant alone, under certain conditions, could cause violations of the 24-hour standard. The table also shows the maximum 24-hour SO_2 concentration that could be expected with a switch to 4% sulfur coal, indicating that Federal SO_2 standards would not be violated. There may be a possibility of allowing a higher sulfur content oil to be used at this plant than that used during 1973, however more recent air quality data would have to be analyzed before any revision to existing emission limits are considered.

3.4.3 Industrial, Commercial, Institutional Source Assessment

The major particulate and sulfur dioxide sources in this region are listed in Table D-1. Most of these sources are oil fired facilities, however with particulate standards having been exceeded, there is little potential for switching to coal. The use of higher sulfur fuel may be possible depending upon current air quality. Point source fuel combustion contributes approximately fourteen percent of the particulate emissions and a small amount of the sulfur dioxide emissions.

3.4.4 Area Source Assessment

Area source fuel combustion accounts for approximately thirty-five percent of the particulate emissions and twenty-three percent of the sulfur dioxide emissions in this region. Fuel use by area sources is shown in Table E-1, indicating that these sources account for the majority of the distillate oil and natural gas use in the region.

3.4.5 Fuel Use Assessment

Fuel use data for the region is presented in Appendix E.

3.5 METROPOLITAN BALTIMORE INTRASTATE AIR QUALITY CONTROL REGION

3.5.1 Regional Assessment

This region has been proposed as an Air Quality Maintenance Area for both particulate matter and sulfur dioxide.

During 1973 suspended particulate levels were in violation of both the Federal annual and 24-hour primary standards. Both of these standards were exceeded at several locations in this region and a significant reduction in these levels is needed to meet standards (Table A-4). This region has been rated as a poor candidate for relaxation of particulate emission regulations.

Sulfur dioxide levels did not exceed the Federal annual or 24-hour standard during 1973 although the State standards were exceeded. Although the air quality data (Table A-5) indicate a tolerance for an increase in SO_2 levels, the region is rated as a poor candidate for regulation revision

since it has been proposed as an AQMA for sulfur dioxide.

3.5.2 Power Plant Assessment

There are twelve power plants in this region having a combined generating capacity of over 2500 MW. These plants are primarily oil fired, although the H.A. Wagner plant fired coal and oil, and two plants fired blast furnace gas and coke oven gas. (Table C-1)

Since there is a substantial amount of fuel oil used by these plants, there is a potential fuel saving. However, a switch to coal is precluded by the fact that particulate levels are exceeding standards in this region and may be further aggravated unless there is high particulate collection efficiency at these plants. Sulfur dioxide emissions could be increased based on air quality data, however the region has been rated poor as previously discussed.

Electricity generation accounts for approximately nine percent of the particulate emissions and forty-five percent of the sulfur dioxide emissions in the region.

3.5.3 Industrial, Commercial, Institutional Source Assessment

There are several major fuel combustion sources in this region which are listed in Table D-1. All of these sources are firing oil, the majority of the fuel having a sulfur content of 0.8% or less. As with power plants, there is a clean fuel saving potential, however there is virtually no potential for switching to coal or increasing the fuel sulfur content for the reasons mentioned above. Point source fuel combustion accounts for a small percentage of the particulate and sulfur dioxide emissions in the region.

3.5.4 Area Source Assessment

Area sources contribute approximately thirty-three percent of the particulate emissions, and seventeen percent of the sulfur dioxide emissions in the region. Fuel use by area sources is shown in Table E-1 indicating that these sources account for most of the distillate oil and natural gas use in the region.

3.5.5 Fuel Use Assessment

Fuel use data for the region is presented in Appendix E.

3.6 SOUTHERN MARYLAND INTRASTATE AIR QUALITY CONTROL REGION

3.6.1 Regional Assessment

There are no proposed Air Quality Maintenance Areas for either particulate matter or sulfur dioxide in this region.

Ambient levels of suspended particulates and sulfur dioxide did not exceed either the Federal or State standards during 1973, and air quality data indicate a tolerance for an increase in ambient concentrations while still maintaining air quality standards (Table A-4, A-5).

This region has been rated as a good candidate for revision of both particulate and sulfur dioxide emission limits.

3.6.2 Power Plant Assessment

There is one power plant in this region, the Morgantown plant in Charles County. This is a dual fired (coal and oil) facility burning a mixture of 75% oil and 25% coal. The sulfur content of the fuel averaged 1.7% during 1973 for both fuels.

Since there is a tolerance for an increase in ambient particulate and sulfur dioxide levels in this region, a fuel savings potential exists either by a switch to full coal firing or the use of higher sulfur fuel. The plant has tall stacks (700 feet), high particulate collection efficiency and is located in a largely rural area without terrain features that would inhibit dispersion.

Table C-2 shows the results of modeling analysis indicating the maximum contribution by the plant to ambient particulate and sulfur dioxide levels. Based on 1973 air quality data, the emissions from the plant when using 3% sulfur coal would not cause violation of the Federal primary or secondary annual and 24-hour standards, for either pollutant, although the more adverse range of the State 24-hour standard would be violated.

This plant accounts for a large percentage of the particulate and sulfur dioxide emissions in the region as there are few other fuel combustion sources.

3.6.3 Industrial, Commercial, Institutional Source Assessment

The major particulate and sulfur dioxide sources in this region are shown in Table D-1. The fuel used by these sources is predominantly 0.8% sulfur oil affording a clean fuel saving potential although it is not substantial. A switch to coal or higher sulfur oil may be possible since there is a tolerance for an increase in both particulate and SO_2 levels.

3.6.4 Area Source Assessment

Area sources in this region do not afford a significant clean fuel saving potential. Area source fuel use is shown in Table E-1.

3.6.5 Fuel Use Assessment

Fuel use data for the region is presented in Appendix E.

APPENDIX A

STATE IMPLEMENTATION PLAN BACKGROUND

TABLE A-1

MARYLAND AIR POLLUTION CONTROL AREAS

Air Quality Control Region	Federal Number	Priority Classification[a] TSP	SO_x	NO_x	Population 1975 (Millions)	Proposed AQMA Designations[b] TSP Counties	SO_x Counties
National Capital Inter-State (D.C., Va.)	47	I	I	III	3.16	Montgomery, Prince Georges	None
Central Maryland	112	II	II	III	0.09	None	None
Cumberland-Keyser Inter-state (W.Va.)[c]	113	I	I	III	0.23	Allegany, Garrett, Cumberland City Hagerstown City	None
Eastern Shore	114	II	III	III	0.22	None	None
Metropolitan Baltimore	115	I	I	III	2.23	Anne Arundel, Baltimore County, Carroll County, Harford County, Howard County, Baltimore City	Same Counties As For Particulates
Southern Maryland	116	III	III	III	0.13	None	None

[a] Criteria Based on Maximum (or Estimated) Pollution Concentration in Area

Priority	I	II	III
	Greater than ($\mu g/m^3$)	From - To ($\mu g/m^3$)	Less than ($\mu g/m^3$)
Sulfur Dioxide:			
Annual arithmetic mean	100	60-100	60
24-hour maximum	455	260-455	260
Particulate matter:			
Annual geometric mean	95	60-95	60
24-hour maximum	325	150-325	150

[b] Federal Register, July, 1974 counties showing potential for NAAQS violations due to growth.

[c] Originally designated as Interstate Abatement Conference Area

TABLE A-2

AMBIENT AIR QUALITY STANDARDS

		Total Suspended Particulates($\mu g/m^3$)		Sulfur Dioxide($\mu g/m^3$)			
		Annual	24-Hour	Annual	24-Hour	3-Hour	1-Hour
Federal	Primary	75(G)	260[a]	80(A)	365[a]	----	----
	Secondary	60(G)	150[a]	---	--	1300[a]	----
State	Serious Level	75(A)	160[a]	79(A)	262[a]	----	525[b]
	More Adverse Range						
	Upper Limit	75(A)	160[a]	79(A)	262[a]	----	525[b]
	Lower Limit	65(A)	140[a]	39(A)	131[a]	----	262[b]

(G) Geometric mean

(A) Arithmetic mean

a - Not to be exceeded more than once per year

b - Not to be exceeded more than once per month

TABLE A-3

AIR QUALITY STANDARDS ATTAINMENT DATES[a]

Air Quality Control Region	Federal Number	Attainment Dates: Particulates Primary	Particulates Secondary	Sulfur Dioxide Primary	Sulfur Dioxide Secondary
National Capital	47	7/75	7/75	7/75	7/75
Central Maryland	112	7/75	7/75	a	7/75
Cumberland-Keyser	113	7/75	7/75	7/75	7/75
Eastern Shore	114	b	7/75	b	b
Metropolitan Baltimore	115	7/75	7/75	7/75	7/75
Southern Maryland	116	b	b	b	b

[a] From State Implementation Plan

[b] Air quality levels below standards

TABLE A-4

MARYLAND AIR QUALITY STATUS (1973), TSP[a]

Air Quality Control Region	# Stations Reporting	TSP Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Exceeding Ambient Air Quality Standards Primary Annual	Primary 24-Hr[b]	Secondary Annual	Secondary %	Secondary 24-Hr[b]	Secondary %	% Reduction Required to Meet Standards[c]	Standard on Which % Reduction Is Based
National Capital	64	85[d] 60[f]	668[e] 366[f]	351[e] 218[f]	2	3	7	11	7	11	+65	24-Hr.
Central Maryland	8	85	210	197	1	0	2	25	2	25	+51	Annual
Cumberland-Keyser	6	85	423	185	2	0	5	83	4	67	+51	Annual
Eastern Shore	7	60	207	206	0	0	0	--	1	14	+35	24-Hr.
Metropolitan Baltimore	31	132	415	403	5	5	13	42	17	55	+80	Annual
Southern Maryland	4	38	120	102	0	0	0	--	0	--	-67	24-Hr.

[a] Source: National Air Data Bank, July 28, 1974; Maryland State Yearly Air Quality Data Report, 1973

[b] Violations based on more than one reading in excess of standard.

[c] Formula: $\left(\frac{\text{2nd Highest 24 Hr - 24 Hr Secondary Standard}}{\text{2nd Highest 24-Hr - Background}}\right) \times 100$, $\left(\frac{\text{Annual - Annual Secondary Standard}}{\text{Annual - Background}}\right) \times 100$

[d] Reading recorded in District of Columbia portion of AQCR, source: Annual Report on the Quality of the Air in Washington D.C. 1973

[e] Reading recorded in Virginia portion of AQCR

[f] Highest reading in Maryland

Background Levels: 36 $\mu g/m^3$ in National Capital, Central Maryland and Cumberland-Keyser AQCRs
46 $\mu g/m^3$ in Eastern Shore AQCR
42 $\mu g/m^3$ in Metropolitan Baltimore AQCR
30 $\mu g/m^3$ in Southern Maryland AQCR

TABLE A-5

MARYLAND AIR QUALITY STATUS (1973), SO_2[a]

Air Quality Control Region	# Stations Reporting 24-Hr (Bubbler)	# Stations Reporting (Contin.)	SO_2 Concentration($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Exceeding Ambient Air Quality Stds. Primary Annual	%	Primary 24-Hr[b]	%	Secondary 3-Hr	% Reduction Required To Meet Standards[c]	Standard on Which % Reduction Is Based
National Capital	26	12	63[d] 34[e]	351[d] 202[e]	322[d] 174[e]	0	-	0	-	3	- 13	24-Hr.
Central Maryland	7	0	18	144	79	0	-	0	-	0	-344	Annual
Cumberland-Keyser	6	2	29	562	104	0	-	0	-	0	-176	Annual
Eastern Shore	5	0	19	73	66	0	-	0	-	0	-321	Annual
Metropolitan Baltimore	21	9	51	295	224	0	-	0	-	0	- 57	Annual
Southern Maryland	4	0	11	66	41	0	-	0	-	0	-627	Annual

[a] Source: Maryland State Yearly Air Quality Data Report, 1973; Annual Report on the Quality of the Air in Washington D.C. 1973

[b] Violation based on 2nd highest reading at any station

[c] Formula:

$$\left(\frac{\text{2nd Highest 24-Hr - 24-Hr Standard}}{\text{2nd Highest 24-Hr}}\right) \times 100, \left(\frac{\text{Annual - Annual Standard}}{\text{Annual}}\right) \times 100$$

[d] Reading recorded in District of Columbia portion of AQCR

[e] Highest reading in Maryland

TABLE A-6

MARYLAND PARTICULATE EMISSIONS SUMMARY[a]

Air Quality Control Region	Total (10^3 tons/yr)	%	Electricity Generation (10^3 tons/yr)	%	Point Source Fuel Combustion[b] (10^3 tons/yr)	%	Area Source Fuel Combustion (10^3 tons/yr)	%
National Capital[c]	14.1	20	5.6	40	0.2	1	2.4	17
Central Maryland	2.7	4	0	0	0.1	4	2.5	19
Cumberland-Keyser[c]	5.7	8	0.5	9	1.7	30	1.8	32
Eastern Shore	4.9	7	0.3	6	0.7	14	1.7	35
Metropolitan Baltimore	36.8	51	3.2	9	1.8	5	12.1	33
Southern Maryland	7.4	10	5.9	80	0.3	4	0.4	5
Total	71.6	100						

[a] Source: Maryland Bureau of Air Quality Control Emission Inventory

[b] Excludes emissions from electricity generation. Includes emissions from major sources in Table D-1 only.

[c] Figures are for Maryland portion of AQCR only.

TABLE A-7

MARYLAND SULFUR DIOXIDE EMISSIONS SUMMARY[a]

Air Quality Control Region	Total (10^3 tons/yr)	%	Electricity Generation (10^3 tons/yr)	%	Point Source Fuel Combustion[b] (10^3 tons/yr)	%	Area Source Fuel Combustion (10^3 tons/yr)	%
National Capital[c]	131.8	35	122.4	93	1.5	1	5.7	4
Central Maryland	2.7	1	0	0	0.7	26	1.0	37
Cumberland-Keyser[c]	27.2	7	4.4	16	19.4	71	3.3	12
Eastern Shore	13.7	4	6.1	45	0.3	2	3.2	23
Metropolitan Baltimore	136.3	36	61.3	45	13.5	10	23.5	17
Southern Maryland	63.8	17	59.2	93	1.7	3	0.8	1
Total	375.5	100						

[a] Source: Maryland Bureau of Air Quality Control Emission Inventory

[b] Excludes emissions from electricity generation. Includes emissions from major sources in Table D-1 only.

[c] Figures are for Maryland portion of AQCR only.

TABLE A-8

MARYLAND FUEL COMBUSTION SOURCE SUMMARY

Air Quality Control Region	Power Plants[a]	Other Fuel Combustion[b] Point Sources		Total Emissions[c] 10^3 tons/yr		% Emissions From Maryland Fuel Combustion Sources	
		Part.	SO_2	Part.	SO_2	Part.	SO_2
National Capital	2	1	6	14.1[c]	131.8	58	98
Central Maryland	0	0	2	2.7	2.7	23	63
Cumberland-Keyser	1	3	5	5.7[c]	27.2	71	99
Eastern Shore	2	1	2	4.9	13.7	65	70
Metropolitan Baltimore	12	1	19	36.8	136.3	47	72
Southern Maryland	1	1	2	7.4	63.8	89	97
Total	18	7	36	71.6	375.5		

[a] Maryland power plants only

[b] Maryland sources, which contribute 100 tons or more per year of particulate or sulfur dioxide emissions

[c] Emissions from Maryland portion of AQCR only

TABLE A-9

SUMMARY OF MARYLAND FUEL COMBUSTION EMISSION REGULATIONS

I Particulates

A. Metropolitan Baltimore, National Capital Interstate AQCRs

Installation Description	Max. rated heat input in million BTU per hour per furnace	Max. Allowable Emission of particulate matter gr/SCFD	Max. Allowable emission; Shell Bacharach smoke spot test number[a]
Residual oil burning; all installations up to 200 million BTU per hour heat input	Less than 10[b]	No requirement	6
	Less than 10	0.03	4
	10-50	No requirement	6
	10-50	0.025	4
	51-200	No requirement	6
	51-200	0.02	4
Residual oil burning; existing and modified installations	Greater than 200	0.02	4
Residual oil burning; new fuel burning equipment	Greater than 200	0.01	4
Distillate oil burning; all installations	All sizes	No requirement	3
		No requirement	2
Solid fuel burning; all installations	200 or less	0.05	No requirement
	Greater than 200	0.03	No requirement

[a] The method used for measurement of both residual and distillate oil burning equipment shall be in accordance with method D-2156 published by the American Society for Testing and Materials.

[b] Construction of Residual oil fired units of less than 5 million BTU/hour prohibited after February 21, 1971

B. Cumberland-Keyser, Central Maryland, Southern Maryland, Eastern Shore AQCRs

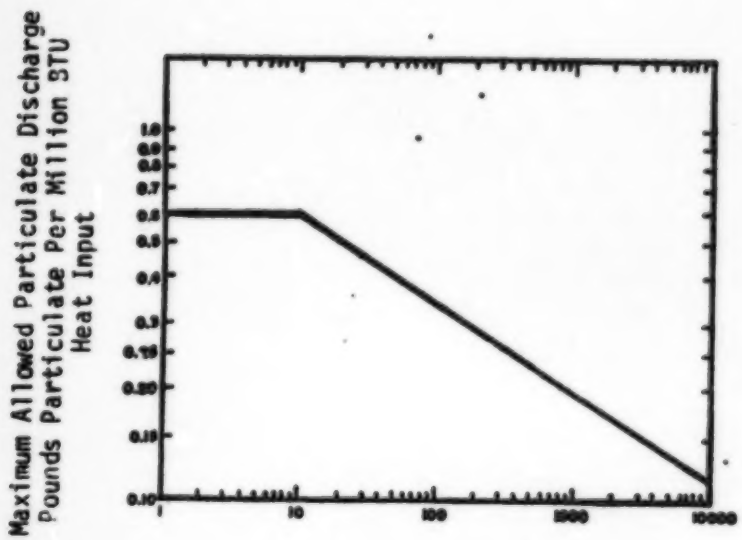
(1) Installations built before January 17, 1972

See Figure A-1

Figure A-1

Maximum Allowable Discharge of Particulate Matter From Existing and Modified Fuel Burning Installations

(Installations Built Before January 17, 1972)



(2) Plants built on or after January 17, 1972

Installation Description	Max. rated heat input in million BTU per hour per furnace	Max. allowable emissions of particulate matter gr/SCFD	Max. allowable emission; Shell Bacharach Smoke Spot test number[a]
Residual oil burning[c]	5-10	0.03	4
	10-51	0.025	4
	51-200	0.02	4
	greater than 200	0.01	4
Distillate oil burning	all sizes	no requirement	2
Solid fuel burning	all sizes[b]	0.03	no requirement

[a] The method used for measurement of both residual and distillate oil burning equipment shall be in accordance with method D-2156 published by the American Society for Testing and Materials.

[b] No new coal burning plants having a rated heat input of less than 250 million BTU per hour are allowed

[c] No new residual oil burning plants having a rated heat input of less than 5 million BTU per hour are allowed.

II Sulfur Oxides

A. Metropolitan Baltimore AQCR

1) All fuels are to contain 1% or less sulfur by weight

2) Distillate fuel oils to contain 0.3% or less sulfur by weight

3) Residual fuel oils to contain 0.5% sulfur by weight on and after July 1, 1975

4) Process gases used as fuel in existing installations to contain 0.3% or less sulfur by weight

B. National Capital AQCR

Same as 1, 2, 3, above

C. Cumberland-Keyser, Central Maryland, Southern Maryland, Eastern Shore AQCRs

1) All solid fuels burned on a premise where the sum total maximum rated heat input of all fuel burning equipment located on the premises is 100 million BTU/Hour or greater, shall contain 1% or less sulfur by weight.

2) All residual fuel oil shall contain 1% or less sulfur by weight until July 1, 1975 at which time the fuel shall contain 0.5% or less sulfur by weight.

3) All distillate fuel oil shall contain 0.3% or less sulfur by weight.

APPENDIX B

REGIONAL SUMMARY

TABLE B-1

REGIONAL INDICATORS FOR REVISION OF PARTICULATE EMISSION REGULATIONS

Air Quality Control Region	Air Quality		Particulate Emissions (10^3 tons/yr)	% Emissions From MD. Fuel Combustion	TSP Priority	Attainment Dates	AQMAs Proposed?
	Number of Stations	Number of[a] Violations					
National Capital	64	14	14.1	58	I	7/75	Yes
Central Maryland	8	4	2.7	23	II	7/75	No
Cumberland-Keyser	6	9	5.7	71	I	7/75	Yes
Eastern Shore	7	1	4.9	65	II	7/75	Yes
Metropolitan Baltimore	31	30	36.8	47	I	7/75	Yes
Southern Maryland	4	0	7.4	89	III	b	No

[a] Total number of violations of annual and 24-hour secondary standard

[b] Air quality levels below standards

TABLE B-2

REGIONAL INDICATORS FOR REVISION OF SULFUR DIOXIDE EMISSION REGULATIONS

Air Quality Control Region	Air Quality: Number of Stations[a]	Air Quality: Number of Violations	SO_2 Emissions (10^3 tons/yr)	% Emissions From MD. Fuel Combustion	SO_2 Priority	Attainment Dates	AQMAs Proposed?
National Capital	38	0	131.8	98	I	7/75	No
Central Maryland	7	0	2.7	63	II	7/75	No
Cumberland-Keyser	8	0	27.2	99	I	7/75	No
Eastern Shore	5	0	13.7	70	III	b	No
Metropolitan Baltimore	30	0	136.3	72	I	7/75	Yes
Southern Maryland	4	0	63.8	97	III	b	No

[a] Total 24-hour bubbler and continuous monitoring stations

[b] Air quality levels below standards

APPENDIX C

POWER PLANT SUMMARY

TABLE C-1

POWER PLANT FUEL USE SUMMARY[a]

Air Quality Control Region	Plant	1973 Capacity (MW)	Fuel Use			Emissions (Tons/Year)	
			Type	% S	Quantity[b]	Part.	SO_2
National Capital	Chalk Point	728.0	Coal	1.64	1,500	3,357	62,861
		660.0[c]	Oil	1.7	112		
	Dickerson	586.5	Coal	1.64	1,400	2,253	59,528
			Oil		74		
Cumberland-Keyser	R.P. Smith	109.5	Coal	0.92	232	512	4,399
Eastern Shore	Vienna	256.5	Oil	0.9	2,332	308	6,122
	Easton Utilities	23.0	Oil	---	54	34	30
Metropolitan Baltimore	C.P. Crane	399.79	Oil	0.54	4,181	368	10,820
	Gould Street	173.5	Oil	0.93	1,440	81	2,544
	H.A. Wagner	980.0	Coal	0.9	749	1,782	32,439
			Oil	0.96	5,190		
	Riverside	333.5	Oil	0.95	2,270	482	7,317
	Westport	194.0	Oil	0.93	1,007	294	2,716
	Perryman	220.0	Oil	---	464	82	402
	Philadelphia Rd.	60.0	Oil	---	245	43	219
	Notch Cliff	120.0	Gas	---	1,471	---	---
	Spring Garden	---	Oil	---	76	27	60
			Gas		808		
	Terminal	---	Oil	---	90	46	85
			Gas		1,684		
	B Street[d]	---	Oil	---	306	---	967
			Gas[e]		39,584		

TABLE C-1 cont.

Air Quality Control Region	Plant	1973 Capacity (MW)	Fuel Use			Emissions (Tons/Year)	
			Type	% S	Quantity[b]	Part.	SO_2
Metropolitan Baltimore (cont.)	Penwood[d]	---	Oil	0.8	1,190	---	3,748
			Gas[e]		6,848		
			Gas[f]		3,375		
Southern Maryland	Morgantown	1451.0	Coal	1.72	550	5,882	59,185
			Oil	1.73	7,229		

[a] Source: Maryland Registration Survey, Bureau of Air Quality Control, Dec. 31, 1974

[b] Fuel Quantity: coal is in 10^3 tons, oil is in 10^3 barrels, gas is in 10^6 cu. ft.

[c] Additional unit presently operating

[d] Plants located at Bethlehem Steel, Sparrows Point

[e] Blast furnace gas

[f] Coke oven gas

TABLE C-2

SUMMARY OF POWER PLANT MODELING RESULTS[a]

Air Quality Control Region	Plant	Maximum 24-Hour Concentration ($\mu g/m^3$)				Maximum Annual Concentration ($\mu g/m^3$)	
		SO_2		Particulates			
		Nominal Load	Maximum Load	Nominal Load	Maximum Load	SO_2	Particulates
National Capital	Chalk Point						
	1972 Operations	108	114	3	3	5	<1
	Fuel Switch[b]	146	155	21	22	7	1
Eastern Shore	Vienna						
	1972 Operations	13	17	3	4	1	<1
	Fuel Switch[c]	166	226	371	505	11	24
Southern Maryland	Morgantown						
	1972 Operations	94	51	2	2	2	<1
	Fuel Switch[b]	178	110	40	39	4	<1

[a] Source: Modeling Analysis of Power Plants For Fuel Conversion (Group III) Walden Research, Sept. 9, 1974

[b] Switch to 3.0% sulfur coal

[c] Switch to 4.0% sulfur coal

ADDENDUM TO APPENDIX C

USE AND LIMITATIONS OF MODELING ANALYSIS DATA[a]

1. The data inputs for the modeling have been extracted from the appropriate FPC Form 67 and the most representative meteorological data available. However, to calculate the occurrence of the highest 24-hour concentration, assumptions as to the daily emission rate are necessary. The results of the modeling exercise provide a range of the most probable maximum concentration.

2. It should be recognized that time and data constraints are such that the model predictions are useful but not omniscient. There are no data available, in general, to "validate" the model. Therefore, all relevant data, including hard data on actual daily plant operations, should be obtained, reviewed, and evaluated. In this way, the modeling results can be used as a logical part of the entire decision-making framework, not as an arbitrary, dogmatic absolute "answer", divorced from the real situation involved. In some cases it will be necessary to adjust the model's predictions based upon more complete and detailed information on a particular plant's operations.

3. Results of these evaluations are not intended to be used in any legal actions, including both public hearing and court proceedings. The very nature of atmospheric dispersion modeling is such that results are not suitable to legally prove (or disprove) a particular modeling result. The assumptions and judgments necessarily involved in modeling tend to mitigate against proof in a legal sense.

4. The best use of the data is in negotiations with states or sources in trying to establish a rational course of action to be followed with reasonable assurance that the air quality impact will be as indicated by the model.

[a] Extracted from comments by the Monitoring and Data Analysis Division, OAQPS

APPENDIX D

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE SUMMARY

TABLE D-1

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL SOURCE ASSESSMENT[a]

Air Quality Control Region	Source	Number of Boilers	Boiler Capacity (10^6 BTU/Hr)	Fuel			Emissions (Tons/Yr)	
				Type	% S	Amount[b]	Part.	SO_2
National Capital	National Naval Medical Center	--	---	Oil	0.6	215	105	571
	Andrews AFB	12	21-66	Oil	1.0	171	23	434
	National Institutes of Health	4	60	Oil	0.3	48	60	276
	Agricultural Research Center	13	8-55	Oil	0.6	42	28	134
	Naval Ordnance Lab	4	28-59	Oil	0.9	47	23	122
Central Maryland	Fort Detrick	5	44-165	Oil	0.8	141	67	363
	Mount St. Mary's College	2	8-15	Coal	2.41	8	51	333
Cumberland-Keyser	West Virginia Pulp & Paper	3	338 590 785	Oil Coal Coal	0.6 2.7 2.4	256 168 216	1,206	17,467
	Kelly-Springfield	3	135	Oil	0.8	276	66	728
	Western Maryland R.R.	2	40	Coal	2.6	11	151	530
	PPG Industries	3	45	Coal	1.5	22	210	405
	Maryland Correctional Institute	3	36-100	Coal	2.45	80	80	252

TABLE D-1 cont.

Air Quality Control Region	Source	Number of Boilers	Boiler Capacity (10^6 BTU/Hr)	Fuel			Emissions (Tons/Yr)	
				Type	% S	Amount[b]	Part.	SO_2
Eastern Shore	Firestone Plastics	2	93	Oil	0.8	56	27	146
	Eastern Shore Rendering	4	24-28	Oil	0.8	44	24	132
	Chesapeake Plywood	--	---	Oil Wood	--- ---	1.5 52	650	17
Metropolitan Baltimore	Bethlehem Steel	--	---	Gas #3 Oil #4-6 Oil	--- --- ---	1,519 1,905 2,000	1,133	8,830
	FMC Corp.	3	44-97	Oil	0.8	189	51	566
	American Sugar Co.	4	130	Oil	0.8	200	33	528
	AMOCO Oil Co.	2	75	Oil	0.8	96	29	511
	EXXON	3	121	Oil	0.8	143	48	395
	Chevron Asphalt Co.	2	68	Oil	0.8	120	58	319
	Allied Chemical	2	42-50	Oil	0.8	105	19	250
	Proctor & Gamble	2	80-125	Oil	0.8	131	12	250
	Springfield State Hospital	2	85	Oil	0.8	85	32	228
	Fort Meade	16	7-57	Oil	0.3	217	69	196
	Baltimore City Hospital	4	71	Oil	0.8	54	35	196
	203 North Avenue Complex	2	180	Oil	0.8	142	35	190

TABLE D-1 cont.

Air Quality Control Region	Source	Number of Boilers	Boiler Capacity (10^6 BTU/Hr)	Fuel			Emissions (Tons/Yr)	
				Type	% S	Amount[b]	Part.	SO_2
Metropolitan Baltimore (cont.)	Simkins Industries	--	---	Oil	---	71	35	186
	Bethlehem Steel	--	---	#1-2 Oil #4-6 Oil	--- ---	0.6 69	33	179
	D.C. Children's Center	8	15-40	Oil	0.8	53	47	139
	Spring Grove State Hospital	3	75	Oil	0.8	119	10	138
	Edgewood Arsenal	--	---	Oil	0.3	132	42	124
	Aberdeen Proving Grounds	--	---	Oil	---	146	44	122
	Maryland Shipbuilding & Dry Dock	4	8-22	Oil	0.8	45	20	119
Southern Maryland	Naval Ordnance Station	6	20-180	Oil Coal	0.8 1.0	474 0.6	236	1,321
	Patuxent Naval Air Station	4	14-65	Oil Oil	0.3 0.8	29 138	75	392

[a] Sources which emit 100 tons or more per year of particulates or sulfur dioxide. Sources are listed in decreasing order of SO_2 emissions. Data taken from Maryland Registration Survey, Bureau of Air Quality Control, Dec. 31, 1974

[b] Fuel Quantity: coal is in 10^3 tons/year, oil is in 10^3 BBLS/year, gas is in 10^6 cu. ft.

AQCR FUEL USE SUMMARY
TABLE E-1

FUEL USE SUMMARY[a]

Air Quality Control Region	Coal (10^3 tons)		Oil(10^3 Barrels)		Gas(10^6 cu.ft.)	
	Anthracite	Bituminous	Residual	Distillate	Natural	Process
National Capital						
Area Sources	9	81	8,246	7,009	108,510	0
Point Sources	1	4,444	13,601	280	1,214	0
Total	10	4,525	21,847	7,289	109,724	0
Central Maryland						
Area Sources	3	1	58	521	2,020	0
Point Sources	0	105	276	34	0	0
Total	3	106	334	555	2,020	0
Cumberland-Keyser						
Area Sources	35	5	151	0	9,870	0
Point Sources	0	240	759	0	108	0
Total	35	245	910	0	9,978	0
Eastern Shore						
Area Sources	3	3	257	1,645	6,710	0
Point Sources	0	7	2,859	118	945	0
Total	3	10	3,116	1,763	7,655	0
Metropolitan Baltimore						
Area Sources	21	24	2,510	8,136	68,600	0
Point Sources	0	934	11,761	2,066	27,890	843
Total	21	958	14,271	10,202	96,490	843
Southern Maryland						
Area Sources	0.3	0.1	48	555	1,610	0
Point Sources	0	540.6	7,710	350	0	0
Total	0.3	540.7	7,758	905	1,610	0

[a] Source: Stationary Source Fuel Summary Report (NEDS) December, 1974

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